REMARKS

Claims 27-39 are pending in this application. By this Amendment, claims 34 and 37 are amended. The amendments to the claims are for form. No new matter is added. Applicant respectfully requests reconsideration of the pending claims in view of at least the following remarks.

The courtesies extended to Applicant's representative by Examiners Kwon and Ryan at the interview held August 20 are appreciated. The reasons presented at the interview as warranting favorable action are incorporated into the remarks below, which constitute Applicant's record of the interview.

The Office Action objects to the drawings for allegedly not illustrating an electrolyte membrane as recited in claim 28. As agreed by Examiner Kwon during the August 20 personal interview, at least Fig. 1 illustrates an example of an electrolyte membrane as recited in claim 28. Applicant respectfully requests withdrawal of the objection.

The Office Action objects to claim 34 under 37 C.F.R. §1.75(c) for failing to further limit the subject matter of an intervening claim. Applicant amends claim 34 as discussed during the August 20 personal interview and thereby mooting the objection. Applicant respectfully requests withdrawal of the objection.

The Office Action rejects claim 37 under 35 U.S.C. §112, second paragraph, as allegedly indefinite. Applicant amends claim 37 to depend from claim 36 for proper antecedent basis of "bead gasket." Applicant respectfully requests withdrawal of the rejection.

The Office Action rejects claims 27-30 and 32-38 under 35 U.S.C. §103(a) over U.S. Patent No. 6,080,503 (Schmid) in view of U.S. Patent Application Publication No. 2004/0197563 (Kye); rejects claim 31 under 35 U.S.C. §103(a) over Schmid in view of Kye and in further view of U.S. Patent No. 6,316,139 (Uchida); and rejects claim 39 under

35 U.S.C. §103(a) over Schmid in view of Kye and in further view of U.S. Patent Application Publication No. 2001/0049074 (Mizuno). Applicant respectfully traverses the rejections.

Initially, Applicant asserts that Kye is nonanalogous art. *See* MPEP §2141.01(a). First, Kye is in a different field of endeavor because it concerns exterior automotive panels. Second, Kye is not reasonably pertinent to the problem addressed by the claimed invention, and thus irrelevant, because it does not concern the peeling strength or sealing ability of an adhesive in a fuel cell. At least for this reason, the rejection is improper.

Further, the Office Action alleges that Schmid discloses the fuel cell stack as recited in claim 27 and acknowledges that Schmid fails to disclose a fuel cell stack wherein the adhesive layer has a Young's modulus within the range of 30 MPa to 100 MPa as recited in claim 27(Office Action, page 5). The Office Action alleges that Schmid's deficiency is cured by the disclosure of Kye.

Specifically, the Office Action alleges that Kye teaches that epoxy adhesives have been used in various industries to bond two surfaces together (Office Action, page 6). The Office Action notes that Kye teaches epoxy adhesive compositions having a wide range of Young's moduli in paragraphs [0156]-[0156] (*Id.*). The cited paragraphs of Kye merely disclose adhesive compositions having a range of Young's moduli from ~13 MPa to ~413.7 MPa. The Office Action alleges that the various embodiments of adhesive compositions with the corresponding Young's moduli establishes that the Young's modulus is a result effective variable. Applicant respectfully traverses this assertion.

A result-effective variable is a variable that achieves a recognized result (MPEP §2144.05(II)(B)). Merely listing a wide range of adhesive compositions with a wide range of Young's moduli fails to establish that the Young's modulus of an adhesive is a result-effective variable. Importantly, the Office Action fails to provide the result that optimizing the Young's modulus achieves. Merely listing the wide range does not provide an affect of

changing the Young's modulus within the context of fuel cell stacks. In other words, Kye does provide any guidance to vary the Young's modulus to achieve a particular result in the application of using adhesives in fuel cell stacks.

During the August 20 personal interview, Examiner Kwon alleged that the result a skilled artisan would achieve by varying the Young's modulus is better sealing properties in the application of a fuel cell. However, Kye discloses adhesive compositions in the application of exterior automotive panel applications and not fuel cells (paragraph [0010]). Kye provides no guidance that the disclosure regarding the adhesive compositions used for exterior automotive panel applications applies equally as well to fuel cell structures.

Kye further discloses various tests, including testing the tensile strength (paragraph [0143]) and lap sheer strength (paragraph [0150]). Kye does not disclose or address the peeling strength of the adhesive. Thus, Kye discloses no guidance for applying the disclosed adhesive compositions to fuel cell structures for obtaining the proper sealing properties.

Although not currently used in rejecting claim 27, Mizuno was previously used to reject the claim and is currently used in rejecting claim 39. Thus, Mizuno is objective evidence of the state of the art.

As asserted in response to previous Office Actions, Mizuno expressly states that a peeling strength of a fuel cell of not greater than 0.3 to 0.4 kg/cm causes a gas leak and results in poor reliability for the gas sealing property (Mizuno, paragraph [0064]). Thus, Mizuno discloses that the peeling strength of an adhesive used in a fuel cell must be at least greater than 0.4 kg/cm (Mizuno, paragraph [0064]). Additionally, Mizuno recites, "the adhesive used for bonding the electrolyte film 21 to the separators 24 and 25 has the modulus of elasticity of not greater than 10 MPa or more preferably not greater than 5 MPa" to achieve the desired peeling strength (Mizuno, paragraph [0069]). Importantly, Mizuno further recites "[a]nother adhesive may, however, be used for the same purpose, as long as the adhesive has the

modulus of elasticity of not greater than 10 MPa or more preferably not greater than 5 MPa after cure," (emphasis added) (Mizuno, paragraph [0078]). The discussion in paragraph [0078] does not merely discuss one embodiment, or one preferred embodiment, but discloses that the any adhesive used must have a modulus of elasticity (i.e., Young's modulus) of no greater than 10 MPa.

Based on Mizuno's full disclosure, Mizuno clearly teaches away from using an adhesive with a Young's modulus within the range of 30 MPa to 100 MPa, as recited in claim 27, because Mizuno stresses to not use an adhesive in a fuel cell with a modulus of elasticity greater than 10 MPa. *See* 2141.02(VI). Further, because Mizuno discloses that the peeling strength of an adhesive must be at least greater than 0.4 kg/cm, using an adhesive with Young's modulus within the range of 30 MPa to 100 MPa that results in a peeling strength lower than 0.4 kg/cm would render Mizuno's fuel cell unsatisfactory for its intended purpose. *See* MPEP §2143.01(V).

Considering that the desired result of Young's modulus as alleged by the Examiner during the interview is sealing the fuel cell structure, the knowledge in the art (as evidenced by Mizuno) would teach a skilled artisan away from using an adhesive composition with a Young's modulus within the range recited in claim 27 for sealing a fuel cell structure, regardless of whether the Young's modulus is a result-effective variable. Alternatively, the disclosure of Mizuno at least establishes that the skilled artisan would not have had a reasonable expectation of success by simply trying all of the compositions disclosed in Kye.[1] Thus, regardless of Kye's disclosure, the Office Action has failed to establish any reason to

[1] *See* MPEP §2143(E) which states that if a finding that one of ordinary skill in the art could not have pursued the known potential solutions with a reasonable expectation of success, the obvious to try rationale cannot be used to support a conclusion that the claim would have been obvious to the skilled artisan.

modify Schmid to obtain a Young's modulus of 30 to 100 MPa.[2] Therefore, Kye fails to cure the acknowledged deficiency of Schmid and claim 27 is allowable over Schmid in view of Kye.

Claims 28-30 and 32-38 are also allowable over Schmid in view of Kye for at least the same reasons as claim 27, as well as for the additional features the claims recite. Applicant respectfully requests withdrawal of the rejection of claims 27-30 and 32-38.

The rejections of claims 31 and 39 are based on the allegation that Schmid in view of Kye discloses or would have rendered obvious all of the features of claim 27. Because, as discussed above, Schmid in view of Kye do not disclose and would not have rendered obvious all of the features of claim 27, the rejections are improper. Applicant respectfully requests withdrawal of the rejections.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the claims are earnestly solicited.

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[2] *See* MPEP §§2141(III) and 2142 citing *KSR* which state that an obviousness rejection must include a reasonable rationale as to why prior art references would have been combined or modified.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

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Date: September 23, 2009

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